PLANT SCIENCE TODAY
ISSN 2348-1900 (online)
Vol 12(sp1): 01–08
https://doi.org/10.14719/pst.6033

HORIZON
e-Publishing Group
HePG

RESEARCH ARTICLE

# A study on consumer awareness and purchasing behavior of finger millet products in Coimbatore

**Monika Karuppanan[1], Samsai Thangarasu[2*], Velavan Chellappan[1], Parimalarangan Ramajayam[3] & Gangai Selvi Ramalingam[4]**

[1]Department of Agricultural and Rural Management, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

[2]Directorate of Planning and Monitoring, Tamil Nadu Agricultural University, Coimbatore 641 003, India

[3]Directorate of Research, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

[4]Department of PSIT, AEC&RI, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

*Email: tsamsai@tnau.ac.in

OPEN ACCESS

**ARTICLE HISTORY**
Received: 21 October 2024
Accepted: 27 October 2024
Available online
Version 1.0 : 12 February 2025
Version 2.0 : 13 February 2025

Check for updates

**Additional information**
**Peer review**: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

**Reprints & permissions information** is available at https://horizonepublishing.com/journals/index.php/PST/open_access_policy

**Publisher's Note**: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Indexing**: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc See https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting



**CITE THIS ARTICLE**
Karuppanan M, Thangarasu S, Chellappan V, Ramajayam P, Ramalingam GS. A study on consumer awareness and purchasing behavior of finger millet products in Coimbatore. Plant Science Today. 2025;12 (sp1): 01-08. https:/doi.org/10.14719/pst.6033

## Abstract

This study investigates consumer awareness and preferences for finger millet (*Eleusine coracana*) products in Coimbatore, Tamil Nadu, India. As a nutritionally dense cereal crop, finger millet has gained attention for its potential to address malnutrition and lifestyle diseases. The research assessed awareness of its nutritional benefits, factors driving purchasing decisions and product preferences among urban consumers. A structured questionnaire-based survey was conducted with 150 respondents selected through simple random sampling. The study revealed higher awareness levels of finger millet's nutritional value among younger (21-30 years, 51.64 % highly aware) and female (39.77 % highly aware) consumers. Factor analysis identified product-related aspects, such as nutritional value and convenience, as key influencers in purchasing decisions, explaining 45.19 % of the variance. Preferred product forms included finger millet flour (23 %), noodles (20 %) and porridge (18 %). So, companies should focus on diversifying the millet flour category to attract consumers easily. Garrett's ranking positioned finger millet as the most favoured millet (score 69.5), followed by proso millet (66.0) and little millet (63.0). These findings provide valuable insights for agricultural researchers, plant breeders and food technologists to align crop improvement strategies and product development with consumer preferences. Companies should prioritize marketing to female consumers, who demonstrate higher awareness. Following this, they should focus on younger consumers (21-30 years), who also show significant interest. Marketing strategies should include creating innovative snack items designed to appeal to children, paired with vibrant and engaging marketing campaigns that capture their attention. Additionally, strategies should target health-conscious individuals and male consumers by highlighting finger millet's contribution to overall wellness and emphasizing that finger millet is a versatile food suitable for all demographics and dietary preferences.

## Keywords

consumer awareness; consumer behaviour; finger millet; food industry; millets; millet products

## Introduction

Finger millet (*Eleusine coracana*), commonly known as ragi in India, has gained significant attention due to its remarkable nutritional composition, offering high levels of calcium, dietary fibre and essential amino acids (1). The

growing demand for superfoods like quinoa, chia seeds and millet reflects a worldwide shift towards nutrient-rich, sustainable diets. The global superfoods market has experienced substantial growth in recent years, reflecting a worldwide shift towards nutrient-rich, sustainable diets and indicating a robust demand for superfoods across various demographics (2). Finger millet, with its ability to improve bone health, regulate blood sugar and combat chronic diseases, fits seamlessly into these global superfood trends and has led to increased awareness among urban consumers (3). Consumers are increasingly turning towards millets, including finger millet, as an alternative to polished grains like rice and wheat (4). The shift in consumer preferences has been driven by both health-conscious behaviour and government policies promoting millet consumption under initiatives like the National Millet Mission. The Indian government has suggested to the UN that 2023 be designated as the International Year of Millets to generate demand both domestically and internationally and to supply wholesome food to people across the globe (5). The global millet market was valued at USD 11.53 billion in 2024 and is projected to reach USD 14.43 billion by 2029, growing at a CAGR of 4.6 % (6). More than 40 % of global millet consumption occurs in African countries like Niger, Mali, Nigeria, Burkina Faso and Sudan, where it serves as a staple due to its drought tolerance and suitability for adverse climates. Millet represents 75 % of cereal consumption in Niger and over 30 % in most Sahel countries, with significant importance in Namibia (25 %) and Uganda (20 %). Outside Africa, millet consumption is notable in India, China and Myanmar, while it remains negligible in Latin America, the Caribbean and developed countries (7). However, millet consumption is gaining momentum in Western countries due to growing awareness of its health benefits, gluten-free properties and sustainability, reflecting a shift toward healthier and environmentally friendly diets. India is the world's largest millet producer, contributing around 41 % of the world's total millet production (8) but public and private investments in millet seed development remain limited. This significant production has led to increased research on millet cultivation practices and their impact on yield and nutritional quality (9). The finger millet market in South India has shown an upward trajectory due to both increasing consumer awareness and the introduction of value-added millet products (10). Finger millet consumption has increased by 25 % in urban markets across Tamil Nadu over the last five years. This trend is also observed in other parts of India, with urban consumers showing a growing interest in millet-based products (11). Finger millet consumption in Tamil Nadu has been associated with the increasing recognition of its health benefits, particularly among middle-aged and elderly populations, who value its role in bone health and managing chronic conditions (12). Recent studies have further emphasized the potential of finger millet in improving gut health and reducing inflammation (13). Studies in South India reflect that consumers are more likely to prefer finger millet when presented in processed forms, such as ready-to-cook flours or value-added products like snacks and cereals (14, 15). The development of novel food products incorporating finger millet has been a focus of recent food technology research, aiming to enhance both nutritional value and consumer acceptability (16).

The need for this study extends beyond consumer behaviour to include crucial implications for farmers and food companies. With increasing consumer demand for healthy alternatives, finger millet cultivation presents an opportunity for farmers to diversify and improve their income. Research has shown that millet farming can enhance farmer livelihoods when consumer demand is well-understood (12). In addition to consumer health benefits, finger millet plays a pivotal role in addressing global food security. Its resilience to climate change and suitability for cultivation in marginal soils position it as a crop of the future, capable of feeding growing populations while conserving natural resources (17). For food companies, the study provides valuable insights into how they can tap into the expanding millet market by offering value-added products. Processed finger millet products, such as flour, snacks and ready-to-cook meals, are increasingly preferred by urban consumers due to convenience and health benefits (14). The incorporation of finger millet into functional foods and nutraceuticals is an emerging area of research, opening new avenues for product development (18).

By exploring consumer preferences, this study can help farmers make informed decisions regarding millet production and assist food companies in developing and marketing innovative, value-added millet products. This, in turn, contributes to the sustainability and growth of the millet industry in Coimbatore and beyond. Recent economic analyses have also highlighted the potential of the millet industry in creating employment opportunities and fostering rural development (19). This synergy between agriculture and the food industry is crucial for the sustainability and growth of the millet economy, contributing to broader goals of health, nutrition and economic development both in India and globally.

## Materials and Methods

The research design for this study aims to systematically assess consumer awareness and preferences for finger millet in Coimbatore, focusing on identifying key factors influencing consumer behaviour towards millet products.

### *Research design*

This study employs a quantitative approach, utilising structured questionnaires to collect primary data from consumers in Coimbatore. The research is designed to gather comprehensive insights into consumer preferences, buying behaviours and awareness regarding finger millet, considering various demographic factors such as age, income and education.

### *Type of sampling*

Simple random sampling was employed to ensure that each member of the target population had an equal chance of being selected. This method reduces bias and enhances the representativeness of the sample.

### Sample size

The sample size of 150 respondents was chosen to balance the need for sufficient data to perform robust statistical analysis while ensuring manageable data collection within the time and resource constraints. A study on factor analysis recommended that a sample size of 100–200 is sufficient when factors are defined by multiple indicators (20). Likewise, N = 150 was identified as an adequate sample size for producing reliable results (21). These studies support the appropriateness of the chosen sample size for employing statistical methods such as factor analysis and Garrett ranking to derive accurate and meaningful conclusions.

### Study area

The research was conducted in Coimbatore, Tamil Nadu, a district known for its agricultural diversity and significant consumer base for millet products.

### Data collection

Primary data was collected through standardized questionnaires administered to consumers in malls, grocery stores and local markets in Coimbatore. The questionnaire included the following sections:

### Awareness

Questions aimed at assessing the level of awareness about finger millet, including its nutritional benefits and health advantages.

E.g., 1. Are you aware of finger millet?

Yes

No

2. If yes, what is your level of awareness about millets?

Highly aware (I know all the varieties of millets and their specific nutritional benefits)

Moderately aware (I know millets are good for health and help with digestion, but I'm only aware of a few varieties and their basic benefits.)

Less aware (I don't know much about varieties or their health benefits.)

### Reasons for preference

Items designed to understand the motivations behind choosing finger millet over other grains, such as perceived health benefits, taste and familiarity.

E.g., Please indicate your level of agreement with each statement below using the following scale

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Nutritional value is important to me when choosing millets. ( )

Attractive packaging makes millet products more appealing to me. ( )

My dietary preferences influence my choice of millet. ( )

### Preferred forms of finger millet products

Respondents were asked to indicate their preferred forms of finger millet products, such as whole grain, flour, processed snacks etc.

### Preference for millet varieties

It aimed to understand consumer preferences for various millet varieties, such as finger millet, proso millet, little millet, foxtail millet and other types. For example, Consumers were asked to rank the different varieties of millet according to their preference from 1 to 7 (1- highly preferred, 7 - least preferred).

### Tools of analysis

The collected data was subjected to quantitative analysis using statistical tools such as descriptive statistics, factor analysis and Garrett's ranking. This enabled the identification of key drivers of consumer behaviour while purchasing millet products.

### Percentage analysis

Descriptive statistics are used in the study to calculate and summarize a variety of attributes. Percentage analysis was used to examine consumer knowledge of millet products and demographic factors. The percentage analysis calculation method is shown in Eqn. 1.

$$\text{Percentage analysis} = \frac{\text{Number of respondents in a category}}{\text{Total number of respondents}} \times 100 \qquad \text{Eqn……1}$$

This analysis is crucial for identifying target groups and tailoring marketing strategies to cater to the preferences and needs of different consumer segments in the millet market.

### Factor analysis

Factor analysis is a statistical technique used to reduce a large set of variables to a smaller number of components. This method converts the maximum shared variance from all variables into a single score (22). These scores can be used in future studies as indices of the factors. Factor analysis belongs to the general linear model (GLM) framework and is based on several assumptions, including the existence of linear relationships, the absence of multicollinearity, the inclusion of relevant variables and a genuine correlation between the variables and the factors. While there are different methods available, principal component analysis is the most used.

$$X_i = A_{ij} F_1 + A_{i2} F_2 + \ldots + V_i U_i \qquad \text{Eqn..... 2}$$

Where:

- $X_i$= $i^{th}$ variable
- $A_{ij}$ = Regression coefficient of variable 'i' on factor 'j'
- F = Common factor
- $V_i$= Regression coefficient on the unique factor
- $U_i$= Unique factor

In this study, factor analysis was used to identify the key factors influencing consumer preferences for finger millet, such as health benefits and taste.

### *Garrett's ranking technique*

To conduct a Garrett's ranking analysis responses were collected from consumers in which they were asked to rank their preferences for various finger millet products (23). The ranks were assigned based on their choices and the Garrett Score for each product was calculated using Eqn. 3.

$$\text{Garret score} = \frac{(N + 1 - R_i)}{N} \times 100 \qquad \text{Eqn……3}$$

Where:

* N is the total number of products being ranked.
* $R_i$ is the rank given by the $i^{th}$ respondent.

Once the ranks were collected, the Garrett score for each finger millet product was calculated. The average Garrett score for each product was then determined based on all respondents. The products were ranked according to their average Garrett scores, with higher scores indicating greater preference.

## Results and Discussion

### *Demographic details of respondents*

The demographic details of the sample respondents are presented in Table 1. The Table indicates that out of the 150 respondents, male respondents constituted 41.3 % and female respondents represented 58.7 % (Fig. 1). This suggests a higher female presence in the study, which may correlate with their increased awareness and preference for health-focused products like finger millet. A survey conducted in 2018 reported that 59 % of women and 94 % of working moms make or heavily influence healthcare decisions for their entire families (24).

**Table 1**. Demographic details of respondents

| S.No. | Gender | No. of sample respondents | Percentage (%) to total (n=150) |
|---|---|---|---|
| 1 | Male | 62 | 41.3 |
| 2 | Female | 88 | 58.7 |
| | Total | 150 | 100 |
| **S.No.** | **Age (in years)** | **No. of sample respondents** | **Percentage (%) to total (n=150)** |
| 1 | 21-30 | 91 | 60 |
| 2 | 31-40 | 40 | 27 |
| 3 | 41-50 | 15 | 10 |
| 4 | Above 50 | 4 | 3 |
| | | 150 | 100 |
| **S.No.** | **Profession** | **No. of Sample Respondents** | **Percentage (%) to Total (n=150)** |
| 1 | Private Sector | 56 | 37.33 |
| 2 | Public Sector | 10 | 6.67 |
| 3 | Own Business | 8 | 5.33 |
| 4 | Unemployed | 32 | 21.33 |
| 5 | Student | 44 | 29.33 |
| | Total | 150 | 100 |
| **S.No.** | **Monthly Family Income** | **No. of Sample Respondents** | **Percentage (%) to Total (n=150)** |
| 1 | Upto 20000 | 81 | 54.00 |
| 2 | 20001-30000 | 19 | 12.67 |
| 3 | 30001-40000 | 16 | 10.67 |
| 4 | 40001-50000 | 15 | 10.00 |
| 5 | Above 50000 | 19 | 12.67 |
| | Total | 150 | 100.00 |

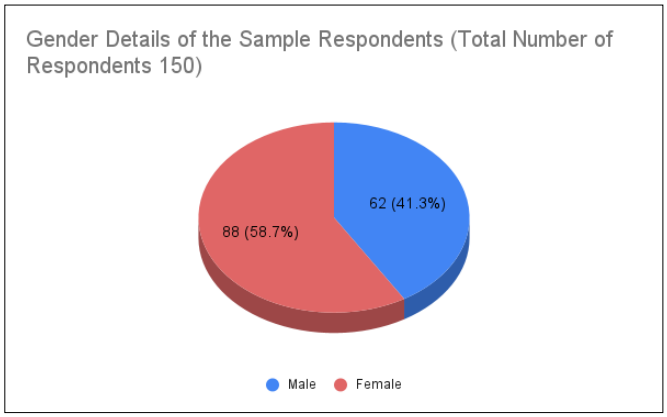


**Fig. 1**. Gender details of sample respondents.

The age distribution reveals that a significant majority (60 %) of respondents were aged between 21 and 30 years. Additionally, 27 % were in the 31-40 age group, meaning that nearly 87 % of the respondents fall within the younger demographic, which is typically more health-conscious and open to trying new dietary options. The representation of older age groups is minimal, with only 3 % being above 50 years old, indicating that the interest in finger millet products is predominantly among younger consumers (Fig. 2). In terms of profession, 37.33 % of respondents were employed in the private sector, while 29.33 % were students. This indicates a diverse professional background among the respondents, with a notable portion engaged in education and employment. Additionally, 21.33 % identified as unemployed, which might influence their purchasing decisions, especially concerning budget constraints when selecting health products (Fig. 3). Regarding monthly family income, a substantial 54 % of respondents reported earning up to ₹20000, categorizing them largely within lower-income brackets. This income level may impact their purchasing behaviour, as affordability is a critical factor in choosing health products. Conversely, 12.67 % reported earnings above ₹50000, suggesting that there is a segment of higher earners who may be more willing to invest in premium finger millet products (Fig. 4).

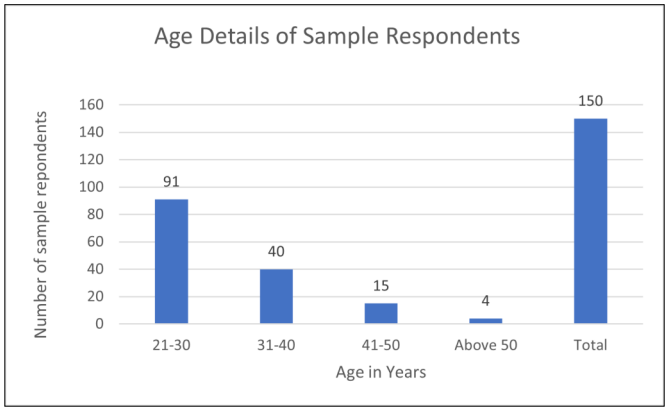


**Fig. 2**. Age details of sample respondents.

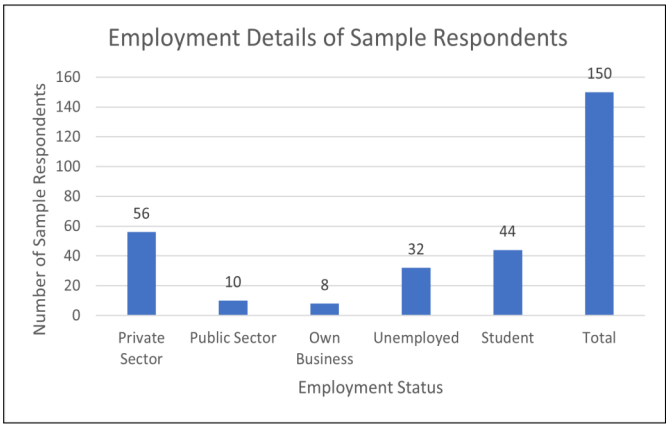


**Fig. 3**. Employment details of sample respondents.

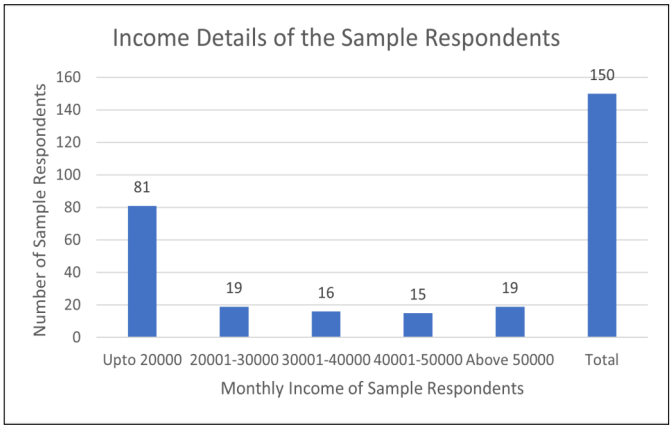


**Fig. 4**. Income details of sample respondents.

### *Awareness of the nutritional value of finger millet*

This analysis presents the level of awareness regarding the nutritional value and health benefits of finger millet across different demographic categories, such as gender, age, profession and monthly family income. Table 2 highlights the varying degrees of awareness-categorized as highly aware, moderately aware and less aware-among different groups. The details of this section are shown in Table 2.

The analysis of consumer awareness regarding finger millet's nutritional value and health benefits reveals notable differences across various demographic groups. Female respondents exhibited a higher awareness level, with 39.77 % classified as highly aware, compared to 19.35 % of male respondents. This could be because women are often the primary decision-makers for household health-related purchases and exhibit a higher degree of health consciousness for their families. Moreover, women tend to be more proactive in seeking health information and preventative care, making them a key demographic for companies promoting health products and services. Age significantly influenced awareness, as 51.64 % of individuals aged 21-30 was highly aware, while awareness decreased with age, particularly in the 41-50 and above 50 age groups, where only 10 % and 5 % were highly aware, respectively. Younger individuals show higher awareness due to their active engagement with digital platforms, where health information and trends are prevalent. Additionally, they are more proactive about maintaining their well-being and are influenced by targeted marketing campaigns focused on their interests. In terms of profession, awareness levels were consistent across different employment statuses, with a slight preference for higher awareness among private sector workers (30 %). Monthly family income also impacted awareness, with those earning above ₹50000 showing the highest awareness at 50 %, while only 15 % of respondents earning up to ₹20000 were highly aware (Fig. 5). This study was in line with earlier research, where finger millet awareness was high among higher-income groups (25). Overall, the data indicates that younger, female and higher-income consumers are more informed about the benefits of finger millet, highlighting a potential market segment for targeted marketing and educational efforts to further enhance awareness and consumption among less aware demographic groups.

**Table 2**. Awareness level sample respondents towards finger millet

| Demographic Characteristic | Highly Aware (%) | Moderately Aware (%) | Less Aware (%) |
|---|---|---|---|
| Gender | | | |
| Male | 19.35 | 38.71 | 41.94 |
| Female | 39.77 | 50.00 | 10.23 |
| Total | 29.03 | 44.35 | 26.62 |
| **Age (in years)** | | | |
| 21-30 | 51.64 | 32.97 | 15.38 |
| 31-40 | 29.87 | 51.28 | 18.85 |
| 41-50 | 10.00 | 30.00 | 60.00 |
| Above 50 | 5.00 | 25.00 | 70.00 |
| Total | 29.03 | 44.35 | 26.62 |
| **Profession** | | | |
| Private Sector | 30.00 | 50.00 | 20.00 |
| Public Sector | 20.00 | 40.00 | 40.00 |
| Own Business | 30.00 | 50.00 | 20.00 |
| Unemployed | 15.00 | 45.00 | 40.00 |
| Student | 35.00 | 45.00 | 20.00 |
| Total | 29.03 | 44.35 | 26.62 |
| **Monthly Family Income** | | | |
| Up to ₹20,000 | 15.00 | 40.00 | 45.00 |
| ₹20,001 - ₹30,000 | 30.00 | 50.00 | 20.00 |
| ₹30,001 - ₹40,000 | 25.00 | 50.00 | 25.00 |
| ₹40,001 - ₹50,000 | 20.00 | 50.00 | 30.00 |
| Above ₹50,000 | 50.00 | 30.00 | 20.00 |
| Total | 29.03 | 44.35 | 26.62 |

### *Factors influencing the purchase of Finger Millets products*

Factor analysis is employed to identify underlying relationships among a large set of variables, allowing researchers to simplify complex datasets by grouping related factors. This statistical tool helps in uncovering patterns that can inform marketing strategies and consumer behavior insights for finger millet products.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated at .889, indicating excellent sampling adequacy for factor analysis. Bartlett's Test of Sphericity yielded a significant chi-square value of 1161.860 with 105 degrees of freedom and a significance level of <0.001, confirming that the variables are sufficiently correlated. Together, these results validate the suitability of conducting factor analysis on the data related to the purchase of finger millet products (Table 3).

The identified factors were categorized into three principal components in Table 4. Product-Related Factors, which include nutritional value and convenience, emphasizing the growing consumer demand for health-

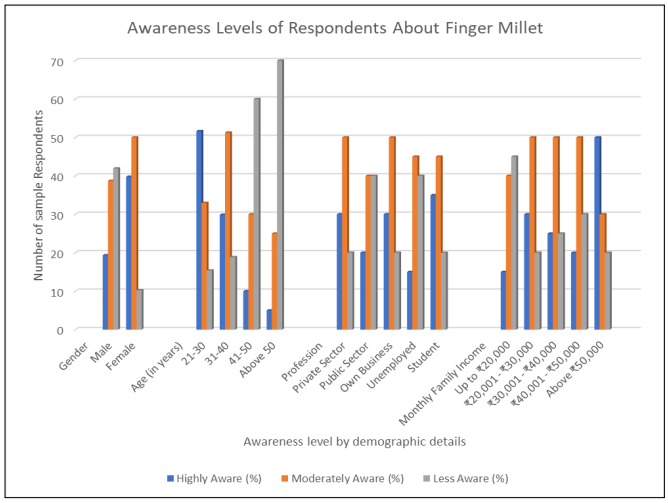


**Fig. 5**. Awareness levels of respondents about finger millet.

**Table 3**. Kaiser-Meyer-Olkin & Bartlett's Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | .889 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1161.860 |
| | df | 105 |
| | Sig. | <.001 |

conscious and easy-to-use products; Consumer-Related Factors, which encompass health consciousness and dietary preferences, reflecting how personal values and lifestyles influence purchasing decisions; and Marketing Factors, focusing on brand awareness and promotional strategies, which highlight the critical role effective marketing plays in shaping consumer behaviour.

This comprehensive analysis not only elucidates the underlying drivers of consumer preference for finger millet products but also provides essential insights for marketers. By understanding these key components, marketers can tailor their strategies to better engage consumers, enhance product visibility and ultimately drive increased purchases of finger millet products. These insights are crucial for fostering growth in the millet market, aligning marketing efforts with consumer values and promoting the health benefits associated with millet consumption.

**Table 4**. Factors influencing the purchase of finger millet products

| Components | Variance % | Factors |
|---|---|---|
| Product-Related Factors | 45.191 | Nutritional Value |
| | | Taste and Texture |
| | | Variety |
| | | Convenience |
| | | Price |
| Consumer-Related Factors | 10.373 | Health Consciousness |
| | | Dietary Preferences |
| | | Cultural Factors |
| | | Lifestyle |
| | | Environmental Awareness |
| Marketing Factors | 7.579 | Brand Awareness |
| | | Packaging |
| | | Promotion |

## *Consumer preference analysis of Finger Millet in Coimbatore*

Analyzing consumer preferences for finger millet products is essential for comprehending market dynamics and addressing the needs of the increasingly health-conscious population in Coimbatore. This analysis enables producers and marketers to tailor their offerings according to consumer demand effectively. Moreover, understanding these preferences can guide farmers in selecting which varieties to cultivate, thereby supporting sustainable agricultural practices and enhancing food security. The analysis reveals that finger millet flour remains a popular choice among consumers, with 23 % preferring it, followed closely by ragi noodles at 20 %. Ragi porridge also has significant popularity at 18 %, indicating a strong inclination toward traditional and convenient meal options (Fig. 6). Products like ragi malt and ragi snacks further highlight the diversity in consumer preferences, showcasing a trend toward healthier snack alternatives. This data underscores the importance of diversifying product offerings in the market to cater to consumer preferences, thus promoting the consumption of finger millet as a healthy alternative.

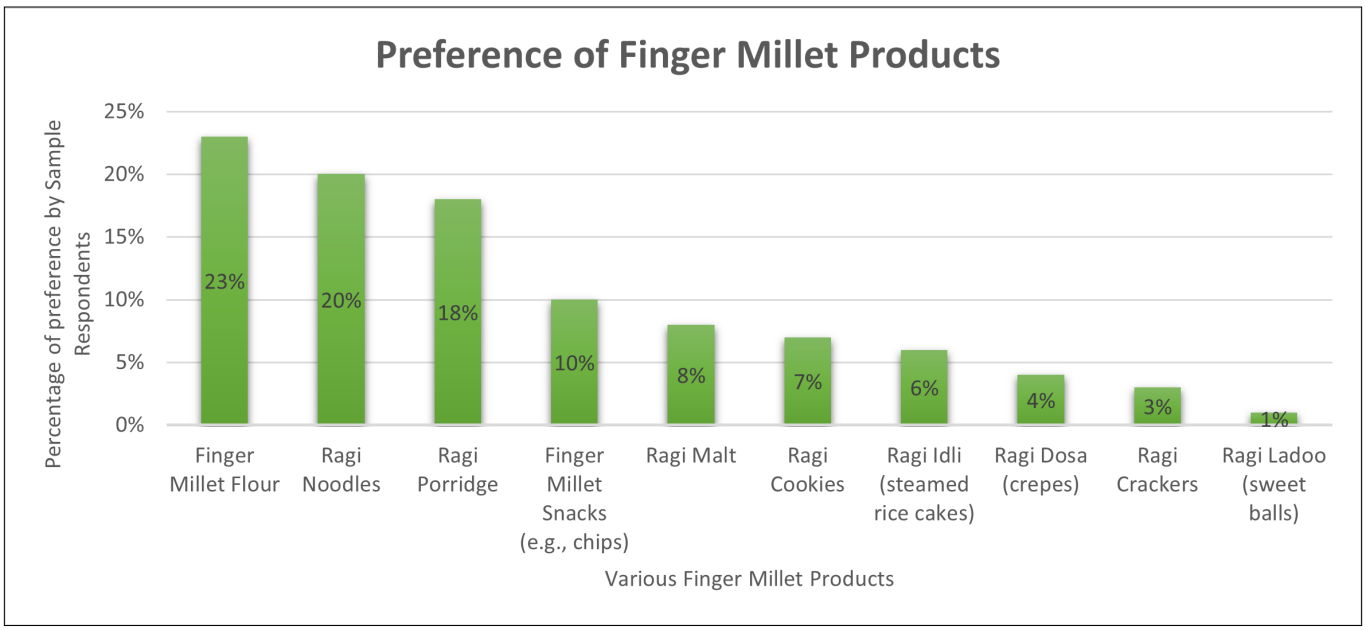


**Fig. 6**. Preference of finger millet products.

The inclusion of ragi crackers adds to the variety, appealing to those looking for nutritious snack options. Overall, this data suggests that finger millet flour is mostly preferred. It could be due to flour being a highly versatile ingredient, commonly used in traditional dishes like rotis and dosas, as well as modern recipes such as smoothies and baked goods. It also serves as a base for many other millet-based products, expanding its range of use in the market. This finding was in line with the study conducted in Andhra Pradesh as they prefer millet flour as their first preference (26). In Africa, most people prefer millet beverages and this serves as an important energy source for Ugandans (27).

### *Consumer preferences for different varieties of millet*

This analysis of consumer preferences for different millet varieties is essential for both farmers and the food industry. It helps identify which millet types, such as finger millet, proso millet, or little millet, are most favoured by consumers, allowing farmers to focus on cultivating the most in-demand varieties. For the food industry, this data enables producers to develop and market products that align with consumer preferences, ensuring better market penetration and increased sales. In this analysis, finger millet (ragi) ranks first with the highest Garrett score of 69.5, followed by proso millet and little millet with scores of 66.0 and 63.0, respectively (Table 5). This indicates that finger millet is the most preferred millet variety among consumers, potentially due to its nutritional benefits and cultural significance. Similarly, a study conducted in Karnataka, Chhattisgarh and Sri Lanka, Africa revealed that finger millet is consumers' preferred variety (25, 27-29). Proso millet and little millet are also popular, but preferences drop for varieties like Kodo millet and Foxtail millet. In future studies, a deeper exploration into the reasons behind consumers' preferences and non-preferences for millet varieties could be conducted. Understanding the factors that drive consumers to favour or reject certain varieties would help producers and marketers refine their strategies and offerings more effectively.

## Conclusion

The study provided valuable insights into consumer preferences for finger millet products in Coimbatore, emphasizing the growing demand for health-conscious food options. The analysis showed that nutritional value was the most significant factor driving product choice, followed by health benefits and traditional consumption practices. Lower price and brand loyalty were also important but ranked lower compared to health-related attributes. Finger millet flour, finger millet noodles and finger millet snacks were among the most preferred product forms of finger millet. Additionally, the ranking of millet varieties indicates a clear preference for finger millet and proso millet, suggesting that farmers and food producers should focus on these varieties to meet market demand. To capitalize on this demand, farmers should focus on cultivating finger millet and aligning production with market needs and adopting sustainable farming practices. Collaborating with food companies can also ensure a steady demand and provide better income opportunities. Food companies should prioritise the development of finger millet-based value-added products and millet snacks emphasising their health advantages and affordability to attract health-conscious consumers. To successfully promote pearl millet, stakeholders must focus on building brand awareness, facilitating product trials, clearly differentiating it from competitive products, offering competitive pricing and, most importantly, educating consumers about its benefits. Policymakers can support these efforts through incentives for millet cultivation and awareness campaigns, further promoting finger millet as a nutritious alternative in the food market. Overall, the insights gained from this analysis can guide the stakeholders to make strategic decisions in the food industry and support sustainable agricultural practices in the region.

## Acknowledgements

I would like to express my sincere gratitude to my advisors and colleagues for their invaluable support and guidance throughout this research. Their insights and encouragement were instrumental in the completion of this work. I am also grateful towards the Tamil Nadu Agricultural University, Coimbatore for its invaluable contributions to this work.

## Authors' contributions

MK did conceptualization of the concept, methodology being employed, data collection, statistical analysis and manuscript writing. ST did the literature review, defined the problem and derived the objectives and overall supervision of the work. VC contributed to the manuscript editing and conceptualization of the work. PR contributed by correcting formal analysis and with necessary data collection. GR assisted in the statistical analysis. All authors read and approved the final manuscript.

## Compliance with ethical standards

**Conflict of interest:** Authors do not have any conflict of interest to declare

**Ethical issues:** None

## References

1. Saha D, Gowda MVC, Arya L, Verma M, Bansal KC. Genetic and genomic resources of small millets. CRC Crit Rev Plant Sci. 2016;35 (1):56–79. https://doi.org/10.1080/07352689.2016.1147907
2. Fernández-Ríos A, Laso J, Aldaco R, Margallo M. Superfoods, a super impact on health and the environment? Curr Opin Environ Sci Health. 2022. https://doi.org/10.1016/j.coesh.2022.100410
3. Singh S, Mugdha D, Maya D. Consumer demand, export and entrepreneurial opportunities of millets: An overview. Int J Agric Ext Soc Dev. https://doi.org/10.33545/26180723.2024.v7.i4g.571
4. Saleh AS, Zhang Q, Chen J, Shen Q. Millet grains: Nutritional quality, processing and potential health benefits. Compr Rev Food Sci Food Saf. 2013;12(3):281–95. https://doi.org/10.33545/26180723.2024.v7.i4g.571
5. Food and Agriculture Organization of the United Nations. Unleashing the potential of millets: International Year of Millets 2023. 2023. https://pminewyork.gov.in/MilletYear2023

6. Mordor Intelligence. Millets market - Growth, trends and forecasts (2021-2026). 2022.
7. Research and Markets. Millet market share analysis, industry trends. 2022. https://www.researchandmarkets.com/reports/4520082/millet-market-share-analysis-industry-trends
8. Devi PB, Vijayabharathi R, Sathyabama S, Malleshi NG, Priyadarisini VB. Health benefits of finger millet (*Eleusine coracana* L.) polyphenols and dietary fibre: A review. J Food Sci Technol. 2014;51(6):1021–40. https://doi.org/10.1007/s13197-011-0584-9
9. Gupta SM, Arora S, Mirza N, Pande A, Lata C, Puranik S, et al. Finger millet: A "certain" crop for an "uncertain" future and a solution to food insecurity and hidden hunger under stressful environments. Front Plant Sci. 2017;8:643. https://doi.org/10.3389/fpls.2017.00643
10. Kumar A, Tomer V, Kaur A, et al. Millets: a solution to agrarian and nutritional challenges. Agric Food Secur. 2018;7:31. https://doi.org/10.1186/s40066-018-0183-3
11. Chandrasekara A, Shahidi F. Bioaccessibility and antioxidant potential of millet grain phenolics as affected by simulated in vitro digestion and microbial fermentation. J Funct Foods. 2012;4(1):226–37. https://doi.org/10.1016/j.jff.2011.11.001
12. Mathanghi SK, Sudha K. Functional and phytochemical properties of finger millet (*Eleusine coracana* L.). Int J Pharm Chem Biol Sci. 2012;2(4):431–8.
13. Kumar A, Metwal M, Kaur S, Gupta AK, Puranik S, Singh S, et al. Nutraceutical value of finger millet [*Eleusine coracana* (L.) Gaertn.] and their improvement using omics approaches. Front Plant Sci. 2016;7:934. https://doi.org/10.3389/fpls.2016.00934
14. Harshitha H, Jayaram D. Consumers' preference for value-added products of finger millet (*Eleusine coracana*). Indian J Econ Dev. 2019. https://www.academia.edu/40316029/
15. Jayawardana SA, Samarawickrama DS, Samarasekera JK, et al. Consumer awareness and preference towards finger millet in Sri Lanka. Asian Food Sci J. 2020;18(3):24–34. https://doi.org/10.9734/afsj/2020/v18i330220
16. Kalaiselvi A, Fathima LR, Parameswari M. Awareness and consumption of millets by women - A study on Coimbatore City. Indian J Appl Res. 2016. https://doi.org/10.36106/ijar
17. Chaudhary J, Shelar R, Thankur K, Singh R. Millets in India: Production, consumption and impact on food security. Asian J Agric Ext Econ Sociol. 2023;41:151–62. https://doi.org/10.9734/AJAEES/2023/v41i81991
18. Gaikwad V, Kaur J, Rasane P, et al. Nutritional significance of finger millet and its potential for use in functional products. Foods Raw Mater. 2023. https://doi.org/10.21603/2308-4057-2024-1-593
19. Food and Agriculture Organization. World millet production and market insights. 2021.
20. MacCallum RC, Widaman KF, Zhang S, Hong S. Sample size in factor analysis. Psychol Methods. 1999;4:84–99. https://doi.org/10.1037/1082-989X.4.1.84
21. Muthén LK, Muthén BO. How to use a Monte Carlo study to decide on sample size and determine power. Struct Equ Model. 2002;9:599–620. https://doi.org/10.1207/S15328007SEM0904_8
22. Lawley DN, Maxwell AE. Factor analysis as a statistical method. Journal of the Royal Statistical Society. Series D (The Statistician). 1962;12(3):209–29. https://doi.org/10.2307/2986915
23. Garrett HE, Woodworth RS. Statistics in psychology and education. Bombay: Vakils, Feffer and Simons Pvt. Ltd.; 1969. https://archive.org/details/statisticsinpsyc00henr/page/n5/mode/2up
24. Hafner Z. What women's health wants in your market. Manag Care. 2018;27(2):28. https://pubmed.ncbi.nlm.nih.gov/29451466
25. Pathak H, Madhu Kiran KN, Gauraha AK. Consumer awareness and consumption pattern of millets and millet-based products in Raipur City, Chhattisgarh. Indian J Agric Econ. 2023;78(3):486–500. https://doi.org/10.63040/25827510.2023.03.012
26. Reddy R, Patel D. A study on consumers' awareness and preference towards millets and its products in Vizianagaram District, Andhra Pradesh, India. Asian J Agric Ext Econ Sociol. 2023;41(6):9–16. https://doi.org/10.9734/AJAEES/2023/v41i61915
27. Kasule F, Kakeeto R, Tippe DE, Okinong D, Aru C, Wasswa P, et al. Insights into finger millet production: Constraints, opportunities and implications for improving the crop in Uganda. J Plant Breed Crop Sci. 2023;15(4):143–64. https://doi.org/10.3389/fpls.2024.1458179
28. Banu A, Ganapathy MS, Siddayya, et al. Consumer preferences for the products of minor millets in Tumakuru District of Karnataka, India. Int J Environ Clim Change. 2022. https://doi.org/10.9734/ijecc/2022/v12i1131215
29. Jayawardana SA, Samarawickrama DS, Samarasekera JK, et al. Consumer awareness and preference towards finger millet in Sri Lanka. Asian Food Sci J. 2020;18(3):24–34. https://doi.org/10.9734/afsj/2020/v18i330220